

REMARKS

Status

Claims 1-14 and 20-22, as previously amended, were at issue in this Office Action. The present response does not add or cancel any claims. Accordingly, it is claims 1-14 and 20-22 which are at issue.

The Rejection

In the Office Action mailed July 29, 2008, the Examiner rejected all of the pending claims. Specifically, claims 1-12, 14 and 22 were rejected under 35 U.S.C. § 103 (a) as being unpatentable over *Kuo* (US 5,686,198) in view of Seto, et al. (EP 0411547 A1). Claims 13, 20 and 21 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over *Kuo* in view of *Seto*, et al. and further in view of *Irvine*, et al. (WO 2003/036746).

Remarks Directed to the Rejection of Claims 1-12, 14 and 22 Under 35 U.S.C. §103(a)

Independent claim 1 has been amended such that an anode for a solid oxide fuel cell is claimed.

The Examiner has stated that with regards to claim interpretation "a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See In re: *Hirao*, 535 F. 2d 67, 190 USPQ 15 (CCPa 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). In claims 1 and 14, the intended use of a solid oxide fuel cell is not given patentable weight." (Paper No. 20080729, § 1, page 2.)

Applicant respectfully submits that failure to give patentable weight to the recitation found in the pending claims of an anode for a solid oxide fuel cell was improper and reconsideration is so requested. While the recitation found in Paper No. 20080729 as to treatment of a preamble is correct, the pending claims are respectfully submitted to not meet the requirements necessary for the pending claims to fit within the holdings of *In re Hirao* or *Kropa v. Robie*.

The preamble of amended claim 1 does not recite a purpose or an intended use of the double perovskite oxide material, nor does the body of the claim stand complete absent the preamble. Specifically, the body of claim 1 includes structural recitations found within an anode for a solid oxide fuel cell as discussed in greater detail below. To view the body of pending independent claim 1 absent the recitation of the anode for a solid oxide fuel cell represents a reading that removes the context, namely a solid oxide fuel cell anode to which modifications are provided in the claim body. As an anode for a solid oxide fuel cell according to claim 1 is not within the holdings of *In re Hirao* and *Kropa v. Robie*, it is respectfully submitted that it is improper not to provide patentable weight to the structural limitation.

Applicant respectfully submits that the proper line of case law relevant to the preamble of pending claim 1 is as follows:

Any terminology in the preamble that limits the structure of the claimed invention must be treated as a claim limitation. See, e.g., *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257, 9 USPQ2d 1962, 1966 (Fed. Cir. 1989) (The determination of whether preamble recitations are structural limitations can be resolved only on review of the entirety of the application "to gain an understanding of what the inventors actually invented and intended to encompass by the claim."); *Pac-Tec Inc. v. Amerace Corp.*, 903 F.2d 796, 801, 14 USPQ2d 1871, 1876 (Fed. Cir. 1990) (determining that preamble language that

constitutes a structural limitation is actually part of the claimed invention). See also *In re Stencel*, 828 F.2d 751, 4 USPQ2d 1071 (Fed. Cir. 1987). (The claim at issue was directed to a driver for setting a joint of a threaded collar*;>< however>< the body of the claim did not directly include the structure of the collar as part of the claimed article. The examiner did not consider the preamble, which did set forth the structure of the collar, as limiting the claim. The court found that the collar structure could not be ignored. While the claim was not directly limited to the collar, the collar structure recited in the preamble did limit the structure of the driver. “[T]he framework – the teachings of the prior art – against which patentability is measured is not all drivers broadly, but drivers suitable for use in combination with this collar, for the claims are so limited.” *Id.* at 1073, 828 F.2d at 754.). (MPEP 2111.02(I))

In light of the above remarks indicating that the anode for a solid oxide fuel cell which is made at least partially out of a double perovskite oxide material according to claim 1 represents a claim limitation, and given the case law details above, it is respectfully requested that patentable weight be given to the recitation of an anode for a solid oxide fuel cell, even if found in the claim preamble.

In addition to and/or in combination with the arguments above, claims 1-12, 14 and 22 are also submitted to be patentable for the following reasons. A person skilled in the art would realize that anodes have certain structural and physical requirements, for example as detailed on page 7, lines 20-23 and page 12, lines 19-28 and shown in Figure 5 of the present application. Any arrangement of perovskite oxide material would not necessarily function acceptably as an anode. In addition, as detailed in the response to the previous Office Action mailed on December 12, 2007, anodes require certain specific properties that are not necessarily the same as the properties required for other components of the fuel cell. Such properties may include, for example, electrochemical performance and catalytic properties under anodic conditions (page 3,

line 27 to page 4, line 2 of the present application), reduced carbon formation when using hydrocarbon fuels (page 2, lines 11 to 13), degradation resistance (page 4, lines 14 to 156) and porosity (page 7, lines 20-23). Therefore, the preamble of the claim adds weight and completeness to the claim and should be given patentable weight. Given that the preamble deserves patentable weight, then claim 1 is clearly non-obvious over *Seto* and *Kuo*, as these documents describe separators and cathodes respectively, and neither of these documents teach or suggest an anode wherein at least part of the anode is a double perovskite material having the formula as claimed in claim 1.

In any event, *Kuo* does not disclose anodes composed of a double perovskite material. *Kuo* instead discloses cathodes composed of doped single perovskite materials (column 6, lines 27 to 47). Doped single perovskites as described in *Kuo* have a distinctly different composition and nature to the double perovskites as claimed in claim 1, as explained on page 2, lines 24 to 26 and page 5, lines 12 to 22 of the present application. As such, a person skilled in the art would not replace the single perovskite materials of *Kuo* with compositional features relating to a different class of materials, i.e. double perovskite materials. In addition, *Seto* teaches that increasing the doping level of metal M makes it more difficult to obtain a solid solution. Therefore a one skilled in the art would be dissuaded from increasing the corresponding doping level in the materials described in *Kuo*. Stated differently, *Kuo* and *Seto* teach away from the present invention and both actually support the novelty and nonobviousness of the present invention insofar both references show and suggest that materials other than the specifically recited materials of claim 1 should be used as anodes for fuel cells.

Furthermore, anodes having double perovskite materials as claimed in claim 1 have unexpectedly advantageous properties such as significantly improved electrochemical, electrical and catalytic properties and increased redox stability relative to previously known anodes (see page 3, lines 27 to page 5, line 2 and page 5 lines 33 to 34). There is nothing in either *Kuo* or *Seto* that would lead one skilled in the art to selectively combine features of the materials of *Kuo* and *Seto* to achieve these unexpected benefits, without the benefit of hindsight. Therefore, even if the preamble of claim 1 is not given patentable weight, claim 1 is not obvious in view of *Kuo* and *Seto*. Similar arguments apply to claims 14 and 22.

The Examiner has also expressed the opinion that claims 13, 20 and 21 are obvious in view of *Kuo*, *Seto* and *Irvine*. As detailed in the response to the previous Office Action mailed on December 12, 2007, the material properties that result in a good anode are quite different to those for a cathode (as described in *Kuo*) or a separator (as described in *Seto*). Indeed, it is surprising that a material that functions well as a cathode also operates well as an anode (page 4, lines 33-34 of the present application). As detailed above, it would not be obvious for a skilled person to combine features of different classes of material, as described in *Kuo* or *Seto*, without the benefit of hindsight, let alone to form an anode from such a material. *Irvine* teaches that the fuel electrode could use perovskites based on lanthanum chromate (page 9, lines 31-32). The properties of doped single perovskites are different from those of double perovskites (page 2, lines 13 to 24 and page 5, lines 12 to 22 of the present application). The reference in the *Irvine* document relates to single perovskite materials. Double perovskites as recited in claims 13, 20 and 21 were not contemplated by, or obvious to, the inventors of the *Irvine* application at its filing date, nor is there any teaching in *Irvine* that would lead a skilled person to use double

perovskite materials as claimed in claim 1. In particular, there is no suggestion that the double perovskites as claimed in claim 1 would have the surprising advantages as detailed on page 3, lines 27 to page 5, line 2 and page 5 lines 33 to 34 of the present application. This is corroborated by attached Appendix A which is an Affidavit from John Irvine, a co-inventor of the cited prior art document. Therefore, claims 13, 20 and 21 as presently on file are non-obvious over *Kuo, Seto and Irvine*.

Applicant respectfully requests that the Examiner review the remarks submitted above, the Affidavit in Appendix A, and reconsider and withdraw the present rejection for the reason that the cited prior art does not show or suggest the presently claimed subject matter.

Conclusion

This response is being submitted after the entry of a final rejection. Given the fact that the Remarks clarify the nature of the claimed subject matter and the prior art, and place the application in condition for allowance, applicant respectfully requests that the Examiner give consideration to them and pass this application on to allowance.

Any questions, comments or suggestions the Examiner may have which will place the application in still better condition for allowance should be directed to the undersigned attorney.

Dated: October 29, 2008

Respectfully submitted,

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